



Mobile DTV Widgets

Pushing Mobile DTV Beyond TV



roundbox®

Mobile DTV Widgets are a powerful feature of ATSC-M/H and enable broadcast distribution of a wide range of data services to mobile consumers. By leveraging a station's growing Internet business, Mobile DTV Widgets provide consumers web-like, on-demand access to station content, but delivered with the reach and economics of broadcast networks.



Mobile DTV Widgets deliver data services such as weather forecasts alongside broadcast video.

Bringing the Best of the Web to ATSC-M/H Broadcast

Mobile DTV is the most exciting new opportunity for broadcasters since the digital TV transition. While digital TV laid the foundation for delivering HD video to 100 million households, Mobile DTV extends this base and enables stations to reach the next generation of up to 300 million mobile video devices with television and new services which go beyond TV.

One of the most important of these new services is Mobile DTV Widgets. Defined by the ATSC's Non-Real Time (NRT) Content Services standard, Widgets enable broadcasters to deliver new, web-like data services to their audiences alongside Mobile DTV video channels. Because they leverage ATSC-M/H's IP-based architecture, Widgets provide broadcasters a powerful, flexible system for distributing

a variety of ad-supported file and data content over Mobile DTV. The result is a new, revenue-generating service for broadcasters, which integrates the best of the web, mobile, and broadcast technologies.

This white paper provides an introduction to Mobile DTV Widgets for broadcasters and device manufacturers who are interested in using Non-Real Time services to add value to their products.

Mobile DTV Widgets – User Experience

To demonstrate the power of Mobile DTV Widgets, let's walk through a typical use case. This consumer has a mobile DTV-equipped mobile phone and is browsing a video program from Channel 13, WACN.

Step 1 – The Mobile DTV Widget Catalog

In this example, the TV station WACN is broadcasting a television program and standard Announcement program metadata. Underneath the program title and description, the consumer is presented a series of icons identifying individual widgets being published by the station such as *Headline News*, *Sports*, and *Weather*.



Step 2 – Widget Selection

After seeing the catalog of published widgets, this consumer has selected the Headline News widget. The Mobile DTV client software downloads the widget's content from a broadcast file distribution carousel and presents it to the consumer as a series of article headlines and images.

An important feature of Mobile DTV Widgets is reuse of existing Internet technologies and broadcaster content production efforts. In this case, WACN's Headline News widget is actually an RSS feed retrieved from the station's website.



Step 3 – View Content

After the headline list, the consumer selects a specific headline and the full article body is rendered as an HTML page.



Widgets Support More than Web Content

- While common Web content formats support a wide variety of services, the broadcast and media industries are also introducing new public standard formats supporting unique features.
- The OMA-Rich Media Environment (RME) provides a robust, scalable vector graphics (SVG)-based environment for delivering interactive content both alongside and integrated within broadcast video.
- The Digital Entertainment and Content Ecosystem (DECE) is a consortium of some of the largest entertainment and media companies dedicated to making cross-vendor, interoperable distribution of premium content possible. Via their Common File Format (CFF), DECE's goal is to enable consumers to easily download purchased broadcast content via networks like Broadcast / NRT and play them back on other, Internet-connected devices.

Mobile DTV Widget Content

Mobile DTV Widgets can ingest and publish content in a variety of formats. These formats include not just the RSS feeds described earlier but also HTML pages, JPEG and GIF images, MP3 audio, and H.264 video clips. New, broadcast and media content formats including Rich Media (RME) files and DECE Common File Format (CFF) files can also be distributed within Non-Real Time services. On devices with two-way Internet connections, widget content can also include embedded links back to station content.



Video Download Widgets

An important class of widgets is downloadable video. By distributing video content as files rather than real-time streams, broadcasters can effectively deploy a Push Video-on-Demand (P-VOD) service over their broadcast spectrum. The result for local stations is the ability to distribute locally-produced, ad-supported content such as the weather segment outside of the bounds of the traditional 6:00 news hour.

Station's New Local Media Opportunity

While station growth rates and revenue achievements in local Web content are impressive, they represent only a small fraction of the total revenue available within this burgeoning market. Out of an estimated \$12.7 billion total local online advertising market, TV stations have only tapped into a 8.3 percent share with other local media sites like newspapers and directories, as well as Internet players, commanding much larger portions.

Mobile DTV Widgets provide broadcasters a potent, new weapon for these advertising dollars by creating a new media platform uniquely tailored to their broadcast reach.



Emergency Alert Widgets

Widgets also provide an important framework for helping stations deliver emergency alert material to their communities. The Emergency Alert System (EAS) recently standardized a new, nationwide alert format known as the Common Alerting Profile (CAP). Because EAS-CAP alerts leverage a variety of Internet technologies, they can be easily extended to mobile DTV Widgets and support widely deployed broadcaster initiatives such as Amber Alerts.

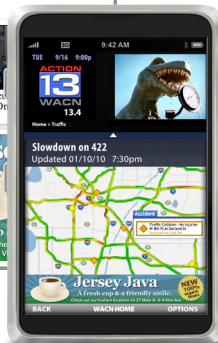
Mobile DTV Widgets = New Revenue For Station Web Investments

Because Mobile DTV Widgets are built from Web content, they provide a new, monetizable service leveraging their existing Web content operations. TV Newsday recently reported that aggregate station revenues from online and Web advertising surpassed \$1 billion in 2008 and AdWeek forecasts 65% aggregate year-over-year growth in this revenue source.

Mobile DTV Widgets take these existing content production and online sales operations and give them new carriage over a new medium – broadcast.



Weather

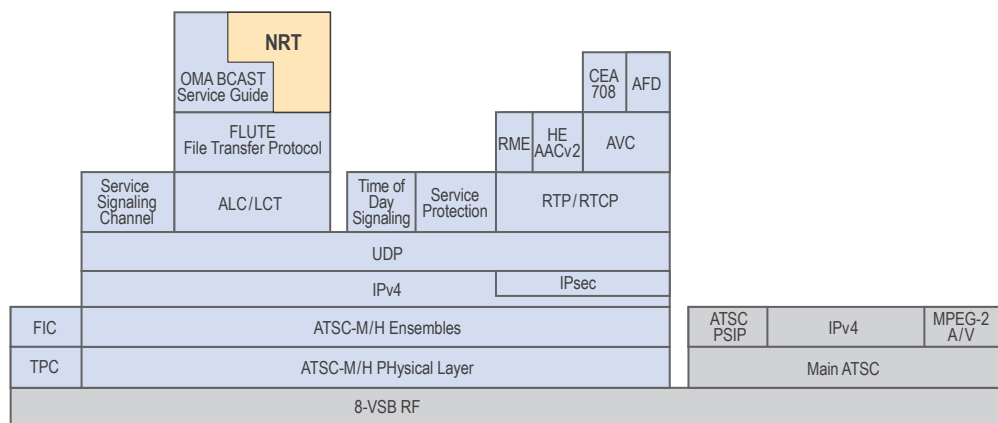


Traffic

Mobile DTV Widgets –Technology

Mobile DTV Widgets are a standards-based extension to Mobile DTV and are defined by the ATSC's Non-Real Time Content Services working group. Mobile DTV Widgets are built using the same, core building blocks found in ATSC-M/H and can thus often be deployed as a straightforward upgrade of the station's Mobile DTV infrastructure.

ATSC Mobile DTV System Protocol Stack



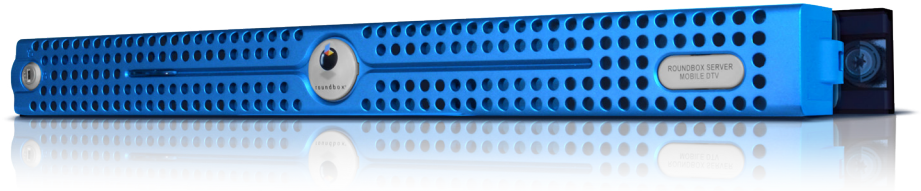
Non-Real Time Content Delivery
 Mobile DTV (A/153 Standard)
 Terrestrial Broadcast

This diagram depicts the protocol layers in an ATSC broadcast environment with mobile / handheld content. Announcement (Service Guide) is optional. The Non-Real Time standard will be available later in 2010.

Roundbox Mobile DTV Widget Solutions

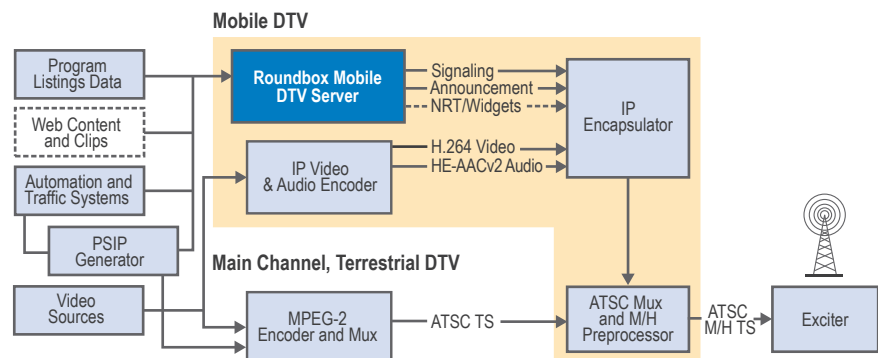
For Broadcasters

As one of the inventors of Mobile DTV Widgets, Roundbox's products provide broadcasters with best-in-class support and guaranteed interoperability for this exciting new service class. Broadcasters who are currently using the Roundbox Mobile DTV Server for signaling and announcement will soon be able to purchase additional software modules which provide targeted support for a variety of widget content types. These add-on modules enable broadcasters to deploy common mass market widget types with simple server upgrades that leverage existing content sources such as station websites.



A key feature of Roundbox's Mobile DTV Server is the use of sophisticated multiplexing and traffic management features. These features allow the server to reliably and opportunistically interleave widgets of various sizes, like web pages and video clips, with widgets of varying priorities like Amber Alerts. These operations are all dynamically performed while avoiding disruption of core Mobile DTV signaling and announcement and strictly adhere to configured bandwidth budgets.

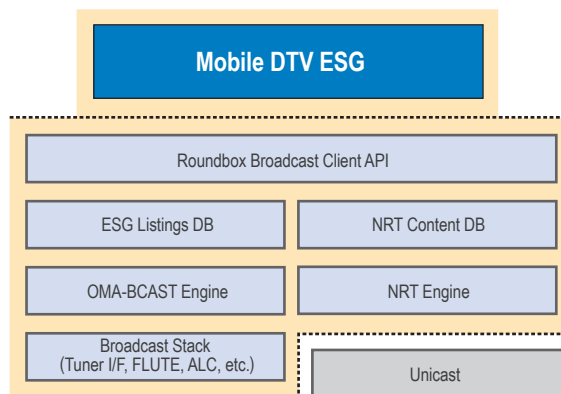
Mobile DTV Head End Deployment



The Roundbox Mobile DTV Server provides broadcasters a crucial building block for deploying Mobile DTV Widgets.

For Device Manufacturers

Mobile DTV Widgets are an integral feature of the Roundbox Mobile DTV Client. The Roundbox Mobile DTV Client is a complete standards-compliant software development kit and application for device manufacturers seeking to embrace Mobile DTV capability. The Roundbox Client is portable across a variety of common mobile and PC platforms and is available in both source and binary licensing options. The software provides a robust API and reference user interface implementation for all core Mobile DTV services including Signaling, Announcement, and Widgets / Non-Real Time content.



Conclusion

Mobile DTV Widgets are a powerful, new opportunity for stations to use broadcast technology to deliver more than TV. While core mobile DTV services deliver video to a new audience of up to 300 million mobile consumers, Mobile DTV Widgets leverage the Non-Real Time Content Services standard to deliver a new class of advertising-supported services. By leveraging station investments in and consumer familiarity with Web content, Mobile DTV Widgets can be quickly deployed and deliver consumers the on-demand, web-like content services they love but using the reach and economics of broadcast content delivery.

For more information about Mobile DTV Widgets, visit <http://www.roundbox.com/mobileDTV> or contact us at sales@roundbox.com to learn more.

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